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## FLOWERLESS PLANTS.

BY DR. A. KELLOGG.

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THE great coal measures of our continent are the grand storehouses of preserved plants from this richest realm of the vegetable kingdom; they are the entombed pioneers that have paved the way, and still light the path of higher forms of life, both vegetable and animal. However much we may to-day value these humble and lower steps on the stage of existence, we are apt to fall far below a due appreciation of their value in the economy of nature; our health, wealth, comfort, nay our very existence more or less, directly depends on the uses they subserve; and still every new dawn brings some novel use crowding the advancing ages until we look back but a few days to our early years, and wonder how we, as well as our forefathers could do without this or that necessary of life. As coal they are the familiar friends of our labors, and the cheerful companions of the domestic fireside. It is not, however, to the dead and fossilized forms alone, but mainly to the living, that we invite a moment's attention.

An idea of minuteness and insignificance too often follows any reference to the simplest plants in nature; yet many attain a great size, such as Tree Ferns and certain Sea-weeds—the former forty feet high, of the size of one's body, and the latter of prodigious length, besides myriads of intermediate forms.

The Fungi, a brief account of which follows, are cellular plants, without flowers, living in the air, often nourished through a stem by an amorphous spawn, or mycelium, instead of a root, and propagated by very minute spores, serving the same purpose as the seeds of flowering plants.

The largest species found in California, is the kind commonly known as Touchwood, or Hard Tinder (*Polyporus*); of a semicircular shape, between one and two feet across,

and six to eight inches thick; this large species we have only seen attached to the living trunks of the Laurel Tree (*Oreodaphne Californica*). Its name signifying *many pores*, describes itself, the lower surface being a mass of little tubes or pores, angular like honey-comb.

As tinder it makes a slow but sure fire and good coal, wind proof, so that as a slow match for blasting purposes it is perfectly safe. It burns at the rate of an inch in five minutes; this rate, of course, will vary a little with thickness. Dipped in nitre and dried it is even more sure on gunpowder than fate itself. The corky kinds of fungi to which this belongs continue to live and increase for many years, although in general mere size is no reliable index of age in this field of inquiry, for we know that under favorable circumstances the Scaly Polyporus (*P. squamosus*), found on the trunks of dead trees, attains, perhaps, the largest size of any known. Instances have been recorded of its measuring seven feet five inches in circumference, and weighing thirty-four pounds avoirdupois, growing to these vast dimensions in the short space of three weeks.

The power of these plants to disintegrate the hardest wood is very remarkable, causing it to yield much more rapidly than the ordinary influences of the weather. Among the greatest agricultural obstacles in the vast timber clearings of the South and West, and indeed of most new countries, are the old stumps, which, if left simply to the action of the weather, might be something less than half a century in decaying; yet if these were simply sprinkled with water in which fungi had been washed, they would shortly crumble beneath the magician's wand, a mere shreddy mass of interlaced cottony touchwood, the tissues and cells of which would be seen to be traversed and disorganized by this amorphous mycelium. We know from actual observation that where heavily timbered land is required to be cleaned off entirely, it often costs from fifty to one hundred dollars per acre. Perhaps to estimate it in human flesh, we might adopt

the western proverb, that it wears out one generation to bring the land into tolerable tillage for the next. Only a few of these plants are known to us, nor do we know their uses except in a few instances. Many of the species we know are very destructive to the trunks of living trees, on which they grow. In the first instance they may grow on parts which are diseased, but the insidious mycelium spreads with great rapidity; the moment any growth of this kind appears the tree should be felled, or if a valuable ornamental tree, the parts affected should be carefully removed, and a strong solution of sulphate of copper or corrosive sublimate be supplied.

Most Polypori are close and tough in their texture, and rather indigestible; still some are eaten. Berkley declares that the most delicious of all fungi is the *P. casareus*. Several other species besides our *P. igniarius* are used as tinder and moxa, and some are said to make famous razor-strops. Certainly a more satiny cushion could not be devised. The common small species, with variegated concentric rings (*P. versicolor*), is used to lure insects from the mycologist's more valuable specimens. One is used in Russia, pounded and put in snuff, to improve its narcotic properties; another has been manufactured into coarse clothing. Only one, I believe, is worshipped, *i.e.*, the *P. sacer*, a most striking object, much venerated by the negroes on the West African coast.

Perhaps many of us have experienced the kindred pleasures of paradise on a walk in the woods after a thunderstorm in the warm days of August, and felt our lungs swell with a thrill of strength to the very fingers' ends, while breathing the balmy odors of the wood; it was not all the breath of flowers, nor foliage, nor any conspicuous form of commonly recognized vegetation. Some may remember having searched for the sweet knots to take home with them, hiding the uncouth thing in the house in order to excite the pleasing wonder and prying curiosity of the loved ones, as

to where that sweet odor came from! It was the sweet scented Polyporus, another species of the same plant. Similar fragrance is observed in one species growing on the birch which is used to scent snuff; another like the soft contents of the puff ball, is celebrated for staunching blood. This fungus has been much used as a remedy, and its virtues vaunted in this country for the cure of consumption in its early stages; so also have similar surprising effects been attributed to the use of *Agaricus emeticus*. The phosphorescent agarics of the olive and palm are luminous like large fire-flies, and a few suffice to light up a large room sufficient to read by.

It is often said that some allied mushrooms are unwholesome, and therefore there is danger, and upon the whole, it is best to let them alone. In reply, might we not inquire if the carrot, celery, parsnip, angelica and anise are not allied to the deadly hemlock? The potato, egg-plant and tomato are also close akin to the poisonous night-shade. The innocent arrow-root, too, is the actual product of the fearful woorai, or *maratta arunamacea*, with which the savage poisons his arrow-points in war. The universal practice in Russia is to salt fungi; and beside they are often subsequently washed and treated with vinegar, which would be likely to render almost any species harmless. Any one familiar with our coast and bays will not fail to hear of cases of poisoning with shell-fish, and there are also sad cases on record of death from these as well as the edible mushroom, or *Agaricus campestris*. Fungi vary in quality with climate, meteorological conditions, soils, etc., so that the safest way is to eat only those raised in garden beds for the purpose; always bearing in mind that much depends upon the mode of preparation and cooking.

The Grape Disease (*Oidium Tuckeri*), is the result of a parasitic fungus, terribly devastating to the wine crops of Europe, the losses of which are estimated by millions, and so frightful as to threaten starvation to thousands; fortu-

nately, the native vines of America are not subject to it, even when cultivated in proximity, on the European Continent.

This fungus plant is easily destroyed by dusting on them flowers of sulphur with a soft brush, when the fruit is well set, about the size of a pea. One application, the Hon. George Hobler, of Alameda, assures me, has proved an infallible remedy with his foreign grapes; had he known its value sooner it might have saved his English gooseberries, which he had plowed up and cast away in utter despair. Currants, and other fruits, are also victims at times. Indeed, one species, *Oidium albicans*, called Thrush, grows in the mouths of children. This can be transplanted and cultivated; a weak solution of potash or salærated will dissolve out the albumen and leave the plant wholly exposed and unchanged. Now, the use of this knowledge is, that the same law and similar remedies are indicated here, as where it attacks the vine, namely, to kill the parasite and cure the disease. It is always pleasing to be able to see in rational light why our grandmothers were right in being so partial to sulphur. One dram of sulphite of soda to an ounce of water is a sure cure.

The *Oidium fructigenum* is often seen in whitish puberulent spots of a greenish gray on oranges; and on apple trees it destroys the fruit while still hanging to them; beans, plums, peas and hops, etc., are also often destroyed, or much injured by its ravages.

A digression into the rationale of remedies for these evils would greatly interest us, but we must forbear; they turn, however, upon a few simple physiological facts—in a word, the Flowerless Plants on land or sea have an oily or shiny coating to the spores, neither the sea water nor air actually touch them; but the moment this adhesive oily or mucilaginous matter is destroyed, they perish; hence the use of ley, lime, ashes, etc., together with many chemical washes.

It is impossible in a short article like this to dwell upon

all the mildews, white and black (*Puccinia* and *Antennaria*) which ruin wheat fields in the North, and orange groves in the South. Rust, or red mildew (*Uredo rubigo*), which, however, is not so injurious as some others, but is still a serious evil—the smut (*Uredo segetum*)—bunt (*Uredo caries*), where the grain looks well, but is a mass of black fœtid sporidia when crushed. If any one of these fungi, out of a thousand, would spread famine and death broadcast over the earth, is it of no use to investigate the subject? As on his rolling main no navigator, coasting its dangerous shores ever contemns the chartings and soundings of science, so let the landlubbers learn to do on theirs.

A brief allusion to a few points in so large a field is all it is hoped to do; but the bald botany of the subject is only to aid the end in view, namely, the practical use of the knowledge; this requires that we add a few words upon the ill effects on men and animals, as well as the gross wealth and prosperity of a country. That the diseased or fungoid cereals referred to are very dangerous to man and beast, no one of proper information will doubt or deny; why they are less dreaded than the larger poisonous fungi, is sufficiently manifest. The Ergot of grasses (e.g. *Agrostis*, *Festuca*, *Elymus*, *Dactylis*, etc.), but chiefly of rye, is one of this class; the fungus is perhaps better known as spurred rye—the symptoms of poisoning from eating it, are general weakness, intoxication, creeping sensation, cold extremities and insensibility; then follow excruciating pains, and lastly, dry mortification—the fingers and toes drop off.

I have known only one case so suddenly serious that the patient lost the fingers and toes; but very many instances where ultimate death of both men and cattle have followed the use of fungoid grain; and also mouldy provisions. Cheese, however, is supposed to be improved by it, and in parts of Europe they inoculate with a plug taken from a mouldy, and introduced into a new cheese; or the curd is exposed for a day or so before making up, so that the float-

ing spores in the air may inseminate the mass. If to some they are improved, there is a species or condition of mould that I have every reason to believe is dangerous to persons of a consumptive predisposition. The black dust of hay fields (*Ustilago*) acts in a more direct manner—hay makers are attacked by violent pains and swellings in the head and face, and great irritation of the entire system. The blue bread mould (*Pencillium*), or a condition of it is found on the inside of casks, the spores of which prove poisonous; this is well illustrated by the two coopers who entered a great tun to clean off this mould, when they were seized with violent pains in the head, giddiness, vomiting and fever, scarcely escaping with their lives.

Alluding to fungi on forests, fruits, shrubberies, grapes and grains, a passing word will not be amiss on the potato disease, caused by the *Botrytis infestans*; its ravages, however, are too well known to this generation for particular details. Another, the *B. bassiana*, attacks the silk worm in China and Syria. The *Achorion microsporon*, *Tricophyton* and *Lychn agrius*, are well known to attack man, to say nothing of the strong probability of their being the origin of malaria, typhus, cholera, and the plague, etc., besides numberless epidemics, which, at least, are preceded and unduly accompanied by these strange and often microscopic wonders of the vegetable kingdom. Unlike other plants the fungi in place of purifying the air—at least, so manifestly—from the poisonous carbonic acid and the other elements of injury, and giving us back the vital oxygen, steal away this, and shed on the shadowing wings of every dark corner of the earth an element, which, if it exceeded a tenth, would annihilate the race; besides all this, they throw off hydrogen, which causes abrasions and sores—mostly of the mucus membranes and air passages; and, finally, as we have seen in some cases, they exhale specific poisonous substances; while myriads of spore-seeds so minute and light as to be scarcely less volatile than ether itself, are poured forth



upon the gentlest breeze, were it even so slight as to leave the gossamer unmoved. Let us not, however, look altogether upon the dark and dismal side of the picture. They all may be, nay, are, beneficent forms of life, only less poisonous and otherwise injurious than would be the fleeting noxious vapors they catch from the atmosphere, as their kindred do the filth of the mighty deep, and hold it back from its fiendish mission of misery to mankind. They come mostly in the melancholy autumn days when the flowers are fading away, and the leaves are falling to decay, when the beautiful fairies have fled from the grassy lawns; when no naiads dance in glee down the glittering wavelets to the boundless ocean; for then even the brook itself loathes and leaves its slimy bed, which, with the aid of crypts, reptiles and creeping things, can scarce suffice to stay or temper the impending plague. Like a grizzly beast of prey, it walks in thick darkness, or sits at bay in the sun-sucked fogs; or, perchance, winds its slow length invisibly along, like a spirit serpent in the stagnant air of the vales and deep mountain gorges; or coils its envenomed form in the dismal cellars and filthy by-ways of our cities. It is notorious that in stagnant water, or in that other fluid, the *air*—where decomposing organisms take on innumerable forms of life—there is the purified and purest portion of the pond. Even the noisome mosquitoes, dragon flies and reptiles, with flowerless plants, render fluids salubrious that were hastening to putrefaction and death.

That like assimilates to like in the realms of spirit and of matter is a universal law that will be seen, and, sooner or later acknowledged. From the vegetable kingdom many examples might be drawn in illustration, and, perhaps, few will be more strikingly in point than the Fly Agaric (*Agaricus muscarius*), so named from its being used to poison flies. This intoxicating fungus is often seen in hilly or subalpine regions, particularly in our forests of fir and birch, where its tall, trim, white stem, and rich scarlet cap, studded with

white, scaly warts, form a beautiful contrast to the soft, green carpet of moss from which it springs, and the elegant emerald foliage that overshadows it. This very poisonous fungus is to the north-eastern nations of Europe and Northern Asia, what opium and hemp are to India and China, awa to the Sandwich Islanders, cocoa to the Peruvians, and what tobacco and various spirituous liquors are to Europe and America. Thus we see, as a reverend writer justly remarks, that the indulgence of these narcotic cravings has at last degraded itself to so low an object in the scale of nature as a common toadstool; and that, too, in the most revolting manner possible to conceive. The Kamtschatkan and Koriac races are so dreadfully degraded that they personify this fungus under the name of *Mocko Moro*, as one of their household gods—like the god Siva of the Hindoo Thugs; if urged by its effects to commit suicide, murder, or some other heinous crime, they pretend to obey its commands, and to qualify themselves for premeditated assassination, they have recourse to additional doses of this intoxicating product of decay and corruption. When steeped in the expressed juice of the native whortleberry, it forms a very strong intoxicating kind of wine, which is much relished. But the more common way of using the fungus is to roll it up like a bullet and swallow without chewing, otherwise it would disorder the stomach. Dr. Greville in the fourth volume of the "Wernerian Transactions," says, one large or two small fungi are a common dose to intoxicate for a whole day, *i.e.*, by drinking water freely, which augments the narcotic action. The desired effect comes on from one to two hours after taking the fungus. Giddiness and drunkenness follow in the same manner as from wine or spirituous liquors; cheerfulness is first produced, the face becomes flushed, involuntary words and actions follow, and sometimes loss of consciousness. Some persons it renders remarkably active, proving highly stimulant to muscular exertion; but by too large a dose violent spasmodic effects are produced.

So exciting is it to the nervous system of many that its effects are very ludicrous; a talkative person cannot keep silence or secrets—one fond of music is perpetually singing, and if a person under its influence wishes to step over a straw or stick, he takes a stride or jump sufficient to clear the trunk of a tree. It is needless to say delirium, coma and death often results as in the case of alcoholic spirits.

The most remarkable fact is that the fluids of the debauchee become similarly narcotic, and are therefore preserved in times of scarcity. Thus a whole village, as some say, may be intoxicated through the medium of one man, and thus one fungus serves to prolong these most fearful and disgusting orgies for many days together. It is worthy of note that the very same erroneous impression as to size and distance produced by this plant, are also created by the *hasheesh* of India, and are also frequently noticed among idiots and lunatics. It has been suggested that many of these may have suffered martyrdom at the stake during the witch mania of Scotland, owing to their natural and temporary defect—*inability to step over a straw* being considered the conclusive test of familiarity with evil spirits. And with those devoted to its intentional use, we should say it really does come within one of it. It is curious to observe how the effects produced by various species of poisonous fungi should be so very similar to alcoholic liquors. The effects in both cases may be traced to a kindred cause. Alcohol, as all know, is the product of fermentation or corruption, arrested at a certain stage of fungoid growth, as also is the case with the yeast and rising process of the pastry cook and brewer. Having, hence, one common origin, it is less wonder their effects should be similar; and, we may add, they tend to produce a like poisoned condition in the human body. This is exemplified in excessive beer and liquor consumers, the slightest accident or even scratch on which will often cause death.

Thus they become the short-lived mushroom humanity

that blooms on the very verge of decay. That these things are nevertheless intended to subserve some good purpose is not denied; every degree of life is wisely provided for, even the worst. This is most manifest from the lowest lichen to the highest vegetable structure; and when mankind observe the true equilibrium of order, the race is justly represented and designated a microcosm, in which from the highest to lowest all things are duly subordinated to an end or use.

The common Puff Ball (*Lycoperdon bovista* and *pratense*) requires special notice. When slowly burnt and the fumes inhaled it produces intoxication, followed by drowsiness and then by perfect insensibility to pain, with loss of speech and motion, while one is still conscious of everything that happens around—realizing the truth that it is possible for one to lie stretched on the funeral bier sensible to weeping friends; aware of the last screw being fixed in the coffin and the last clod clapped down upon us in the churchyard, and yet unable to move hand or lip for our own deliverance. Experiments have recently been made on cats, dogs, and rabbits, and similar effects have been found to invariably ensue. And for ages it has been used in this manner for stupifying bees, and thus robbing their hives with impunity. If the inhalation in man, however, be continued too long, vomiting, convulsions, and ultimate death results.

Much of this lore is still closeted, perhaps, mainly in the secret chambers of the past; the fumes of many plants have been used as spells, enchantments, and to induce spectre seeing, etc., of which we may name some on a proper occasion. In the order of nature, all auras are adapted to human requirements, and under the influence of the last named, unlike our artificial chemicals—chloroform and ethers—the individual remains conscious all the time. I have myself, as well as thousands of others, experienced similar slight trance states of rapture, sweetly and softly celestial, and yet most of all alive to consciousness, with only a dread lest some gross vociferous burst from beneath should break the spell; a dread lest some one should speak to you.

That these fungi are sometimes purely meteoric, is proven by their fastening upon iron and rapidly extending themselves; here the matter is manifestly conveyed to them by the air and moisture. Many Polypori, too, grow on hard tufa of volcanoes without a particle of organic matter. Nevertheless, unhealthy conditions of air, soils, and the object attacked, we have often seen to be true concomitants, so that in most cases they may be deemed consequences, rather than causes, if one prefers that view of the subject—our chief concern being a review of the facts. Some of them, indeed, require certain specific conditions so well known that they can be grown to order, leading shrewd observers to the plausible conjecture that they are of spontaneous generation.

Berkley and McMillan, from whom we collate, mention that in Italy a kind of Polyporus, greatly relished, is grown simply by singeing the stump or stems of hazel-nut trees and placing them in a moist, dark cellar; other instances of extinct fires being followed by fungoid scavengers, imps of the pit, are too well known. Now, as charcoal and other black bodies absorb many hundred times their own bulk of fœtid gases—for the color, *black*, is philosophically and devilishly filthy, and it ardently desires or affiliates with, and pertinaciously clings to foul air and odors; and, as a very fiend, only yields them up readily as contagion, eluding, perchance, the alchemist's wand—the vile spell is hardly broken but by that great power of the universe, *heat*. Hence we see why they make such apt servants and meteoric media for their masters, the Fungi. These plants and other parasites sometimes invade living organisms, both animal and vegetable, in their most vigorous state, but we may safely say, in general terms, that whatever fouls or lowers the standard of life in the human, in the animal, or in the plant, surely invites these disorder-inspecting gnomes from beneath; which move to and fro in the earth—messengers of the shades!—ready to alight upon and claim as their own all such trenchers upon the outer realms of death. It is therefore

not wise, neither naturally, morally nor spiritually, to venture too near that other place.

I well recollect, many years since, while residing in the pine forests of Russell county, Alabama, one of my neighbors (Oliver) was desperately annoyed by some mysterious fœtor, like carrion—only more so. A general search was instituted, and at length an abominable fungus was found growing beneath the steps of his log cabin. I have only known of two instances of this kind. It may, however, be common in the piney wood sections of our country. This is a species of *Clathrus*, a putrid, revolting, jelly-like mass of raw flesh just beneath the loosely-lifted soil. It diffuses such a loathsome stench that none could endure it.

One might object that this stench was owing to its putrid state; not so at all; it is the natural fœtor of the fungus, just as we find in our common pole-cat weed and cabbage, several arums, stapelias, etc. Unless the hiding place of this pest is discovered—and little peace is likely to come to the premises until it is—and the intolerable nuisance abated, with its surroundings, they are apt to repeat themselves. There is a popular superstition that if any one should accidentally touch this monstrous mass it would produce cancer. Hence the custom of carefully covering it over with leaves, moss, earth, etc., to prevent the possibility of a contagion. Now, whatever we may *think* of such superstitions, let us *respect*—I had almost said *reverence*—the intuitive promptings from that purer and better world within and above this lower region of filth and contagion, which causes the sensitive and tidy spirit to shudder at, shrink back from and shun such exposures.

We do most solemnly warn the reader that the most vigorous health may not too rashly presume upon a forced, foolhardy or wanton and careless contact with these, or with those *other* fungi—the moral mildews, moulds and blites of man's paradise.

Recent researches seem to show us how little we yet know,

and well do they warn us not to form too hasty conclusions; nevertheless, with one voice they proclaim these fungi to be more abundant and much more important than is commonly supposed. They are undoubtedly the secret or obscure and often unsuspected proximate causes of many diseases of animals and of man—operating either directly or indirectly. We have already seen that the ergot fungus of ill-drained localities found on the Broom-grass (*Bromus*), and Meadow or Spear-grass (*Poa*), etc., but chiefly on the Rye, sadly deteriorates the blood in every degree from intoxication, inveterate ulceration, and mortification to absolute death, or from first to last, both in man and animals. We cannot dwell here upon the indirect dangers of eating the flesh or drinking the milk of such disordered brutes; the effects are scarcely less deleterious than the fungus itself.

These remarks are true in general as respects other causes or other kinds of vicious vegetation. The black dust of hay fields alluded to (*Ustilago hypodytes*) acts directly, throwing one into a most violent and dangerous fever; so also, the spore dust of the common blue mould (*Pencillium*), as in the case of the coopers previously mentioned. Thus we see that these plants act powerfully and strangely on man, whether their ethereal fumes are inspired, snuffed, or their substances taken into the stomach, or even vegetate on the outer or inner surfaces of the body. They are also known to abound in the lungs of web-footed quacks, and the brains of many animals, but we believe they rarely reach the brains of some Esculapians.

A French chemist and botanist, M. Dutrochet (as quoted by the Rev. E. Sidney), says he found every sort of vegetable matter, with only a drop or so of almost any acid, yielded a mould; but when albumen contained a neutral salt none appeared. If salts of mercury are present the mould is stopped. On the contrary oxides of lead hasten it; oxides of copper, nickel and cobalt retard it; oxides of iron,

zinc, antimony and other minerals have no effect; all perfumes stop it.

Passing in this flying review some of the lower forms of flowerless plants of forests and fields, with a few parasites on man and animals, only touching here and there an interesting and suggestive fact, we finally offer a word on those found upon our farm fixtures, houses, and especially all timber structures, although not confined to them alone, for even the wall, in the pride of its strength, crumblingly bows beneath their stealthy tread.

Builders have a woful knowledge of numerous fungi found on wood, *e. g.* the *Polyporus destructor*, truly as its specific name signifies, a *destroyer*; also *P. thelephora*, from a Greek word, meaning nipple, by reason of its teated surface; and *P. sporothricum*, from the little pore-tubes having hairy filaments hanging out; the one, however, most familiar to me from my earliest recollection is the Weeping Morel (*Merulius lachrymans*), a crying evil. Both this and the *M. vas-tator* are sufficiently devastating to all timbers in warm, moist situations where there is no free circulation of air, as in hollow trees, cellars, wainscoting, timbers of ships, sills, sleepers, etc. These invaders, little less than legion, all pass under one common designation, the *dry rot*.

Weeping morels at first appear in a white spot, or point, spreading their filaments flat over the surface of the timber in rounded white cottony patches from one to eight inches broad, and so onwards; near maturity it forms folds of yellow, orange or brown, weeping Madeira wine colored tears; they soon after mature myriads of dirty, rusty-colored sporules which spread destruction far and wide; wood, books and walls crumble in its consuming path; buildings often, though taken down and the stones scraped and fired, scarcely suffice to stay the scourge. Is this the leprosy of the wall spoken of in Leviticus? Heat applied to dry wood only hastens the malady. It can be forestalled by cutting the timber in winter when the sap is out; and, better still, by immersion in



water for a long time, to fully supplant or extract the entire juices, as is often practiced by the best ship-builders and honest wheelwrights, carpenters, etc., who regard a worthy and enduring reputation. It is said that the ships in the Crimea Sea suffered more from this insidious foe than from the ravages of fire, or the shots and shells of their enemies. We have seen samples of this light, crumbly, papery shelled wood, with its weight and strength totally consumed.

A strong wash of corrosive sublimate solution over the timbers of cellars on which these deliquescent or weeping morels so dampen it, are at once rendered dry, and the evil often entirely arrested in the midst of its havoc.

Lastly, most of us have heard, and many have no doubt seen, specimens purporting to be a caterpillar turned into a plant, or some such similar foolishness. We have one in the herbarium which any one may see at their leisure. This is one of those parasitic fungi, that rob and kill in order to supplant and live on others gains; the dying grub's head never sprouts up as a plant, but the seeds or spores of the *Spheria Robertsii* alight upon the caterpillar of a moth, the *Hepialus*, when it buries itself in the mossy woods to undergo metamorphosis, and by its growth destroys the napping grub. Two species of these are used by the Chinese, who sell them in bundles of eight or nine, with the worms attached, which they place in the stomach of a duck and roast for the patient to eat.

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## VARIATIONS OF SPECIES.

BY A. H. CURTISS.

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IN the March number of the NATURALIST we observe an account of a remarkable growth of *Bidens chrysanthemoides*, and as the writer seems to fear that his story may be considered an exaggeration, we come to his support with one